June 6, 1998

Attention: TANKS USERS!

Following release of TANKS 3.1, several programming errors were identified which have been corrected. The following changes have been made to the program which has been reposted for downloading from the CHIEF Website:

- The emissions calculations use the vapor molecular weight from the program's chemical data base. This change addresses a problem noted in an earlier notice when "single component liquid" was selected for mixtures such as gasoline.

- Antoine's coefficient for m-xylene in the chemical data base was changed from 1426.266 to 1462.266.

- The ambient temperature that prints out on detailed reports for heated tanks was corrected (the heated tank temperature was given instead of the ambient temperature but the calculations were correct).

- The user cannot leave the vapor molecular weight field blank when adding a new chemical to the chemical data base.

- The distillation slope for the three gasolines in the chemical data base was changed from 2.5 to 3.0 to be consistent with the American Petroleum Institute's Manual of Petroleum Measurement Standards, Chapter 19.2, Evaporative Loss From Floating Roof Tanks.

- For fixed roof tanks where "none", "partial", or "vapor weight" is specified as the speciation option, when a change is made that affects the liquid surface temperature (e.g., changes in tank color or city), the minimum, maximum and average liquid surface temperatures and vapor pressures on the liquid information screen update simulataneously (previously, only the average would update automatically).

<u>Recently Identified Programming Errors not Yet Corrected</u>

- If a chemical is added to the chemical data base, the model correctly uses the new physical property data to calculate emissions. However, if the density is changed subsequent to addition of the chemical to the data base, this information is not automatically used in emission calculations (the original density is used). To have the model use the updated density, you must reselect the chemical from the "drop down list" of chemicals. The model then accesses the updated density from the data base and the emissions report will indicate the correct density is now being used. If reselecting the chemical does not fix the problem, delete the tank record and then reenter it.

"Readme" file for changes to AP-42 Section and TANKS Model

The following documents changes made to AP-42 Section 7.1, Organic Liquid Storage Tanks, the background document, and version 3.1 of the TANKS software. These changes are based on new data from API, user comments, and errors or omissions that were discovered through use of the section and program since the February 1996 revisions.

I. CHANGES TO SECTION 7.1

The changes listed below were also made to the corresponding sections of the background document.

1. Added a revised deck seam loss factor for internal floating roof tanks with bolted decks, K_D = 0.14 lb-mole/ft-yr, to replace the old factor of 0.34 lb-mole/ft-yr used in Equation 2-9.

2. Added a new slotted guidepole configuration and factor to Table 7.1-12: gasketed sliding cover with pole sleeve and pole wiper, K_{fa} = 8.3 lb-mole/yr, K_{fb} = 4.4 lb-mole/(mph)^m-yr, m = 1.6.

3. When calculating withdrawal loss, the section now makes it clear that liquid density, W_L, should be used. The example calculations were revised to use the liquid density for withdrawal loss calculations, not the condensed vapor density.

4. The example calculations were moved to the back of the section, following the figures and tables.

5. Corrected errors concerning equation numbers in the sample calculations.

6. Various wording changes were made per API comments.

II. CHANGES TO THE TANKS MODEL

1. Added new deck seam loss factor, K_D = 0.14 lb-mole/ft-yr, to replace the old factor, 0.34 lb-mole/ft-yr.

2. Added new slotted guidepole configuration and factor: gasketed sliding cover with pole sleeve and pole wiper, K_{fa} = 8.3 lb-mole/yr, K_{fb} = 4.4 lb-mole/(mph)^m-yr, m = 1.6.

3. Put values for liquid density into chemical database for petroleums and crudes to replace the values for condensed vapor density that were in the database.

4. Added vapor pressure data for #6 residual oil.

5. Separated breathing and working loss on brief report.

6. Corrected calculations so paint color does not affect emissions estimate for underground storage tanks.

7. Renamed molecular weight field "vapor molecular weight" in the chemical database; added a second field for liquid molecular weight (same as vapor molecular weight for single component liquids). Added generic liquid molecular weights for the petroleums and crude oil in the chemical database. The data were obtained from Radian's study of Section 114 Information Collection Requests for the Refinery MACT standard development.

8. Reformatted the guidepole fitting selection screen so the user can see the whole description.

9. Changed the name to TANKS 3.1.

10. Updated appropriate help screens and user's manual.

11. Removed the verify database integrity option from the menus and help screens.

12. Fixed an error with individual deck fitting losses for domed EFRT's. The program was incorrectly using the site wind speed to calculate the individual fitting losses on the detailed report printout, but was calculating the summary total correctly.

13. Fixed an error in the calculation of the turnover factor on monthly emission reports for horizontal fixed roof tanks with turnovers greater than 36. TANKS was incorrectly calculating the turnover factor based on the monthly throughput, instead of the yearly throughput.